

Well Review: APD Approval NTOs

NTO Area 2

Garfield County Rulison Field Notice to Operators: Notice to all Operators Drilling Williams Fork Formation Wells in Garfield County Surface Casing Depth and Modification of Leakoff Test Requirements (May 2001, June 2006)

- Apply to all wells from Williams Fork and deeper
- Defines Rulison Field over pressured area (map)
 - Surface casing minimum depth of 1100 feet
- Applies to Garfield County
 - Surface casing to be set 10% of the total depth of well

Ex. 5 - Deliberative Process

NTO Area 3

New Mamm Creek Field Notice to Operators: Notice to Operators Drilling Mesaverde Group or Deeper Wells in the Mamm Creek Field Area in Garfield County Well Cementing Procedure and Reporting Requirements (July 2004, Feb 2007)

- Revised after March 2006 “Phase I Hydro Characterization of Mamm Creek”
- Apply to all wells for Mesaverde and deeper
- Specified locations to be applied
- Cement required 500 ft above TOG (top of gas); CBL verification required
 - TOG does NOT appear to be defined; TOG via operators defined as commercial zone NOT shallow gas—this was pointed out in June 2011 Crescent Report
- BH (bradenhead) monitored to 72 hrs after production casing cemented; >150 psi on BH to be reported
- Amount of mud to keep hole full must be reported (Sundry Notice, Form 4) and if >20 bbls mud necessary, then loss of fluid must be reported to COGCC immediately
- BH pressure to be measured at 6, 12, 24, 48, and 72 hours after production casing cemented, >150 psi BH pressure to be reported to COGCC immediately
- CBL/Temp log required within 12-48 hours following cement job
- Cannot delay CBL requirements via temp log in East Mamm Creek Area
- Rig control stipulation—for first (5) wells drilled the operator can only have (1) rig operating in East Mamm Creek Area; if no issues encountered then operator can’t have >2 rigs in operation in East Mamm Creek
- Surface casing to be set at 15% of TD or 500 ft below water well in 1 mile radius
 - Note this requirement supersedes NTO #2
- Formation Integrity Test at least 50 ft below surface casing
- (1) person on-site during drilling to be trained for blow out prevention operations
- Additional BH monitoring (intermediate csg included) for 30 days after cement job; report >150 psi and prepare remediation plan
- BH to be monitored during fracturing operations

NTO Area 4

Compliance with NTO drilling wells in the Buzzard, Mamm Creek, and Rulison Fields, Garfield County and Mesa County: **Notice to Operators Drilling Wells in the Buzzard , Mamm Creek, and Rulison Fields, Garfield County and Mesa County Procedures and Submittal Requirements for Compliance with COGCC Order NOS. 1-107, 139-56, 191-22, and 369-2 (July 2010)**

- Developed to promote BH monitoring and reporting consistency
- BH to be monitored annually--continuous liquid flow or >150 psi to be reported via Form 17
- By Nov 1: report all annual bradenhead data on spreadsheet
 - Note: some operators are NOT following the spreadsheet reporting requirements
- For consistency, well shut-in (7) days prior to conducting test; must bleed off prior to reaching 150 psig and report actual shut-in time
- Venting (ie keeping BH open full time) and continued monitoring is typical mitigation step, combustors encouraged but not being used in many cases
- If >150 psig, high flow rates, or significant fluid (mud or water) then remediation a consideration